

Lathe and Turning Machine Tool Setters, Operators, and Tenders

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What They Do

Lathes have been used for thousands of years to shape round objects by turning material on an axis while forcing material against a sharp tool. Lathe and Turning Machine Tool Setters, Operators, and Tenders (Metal and Plastic) set up, operate, or tend lathe and turning machines to turn, bore, thread, form, or face metal or plastic materials, such as wire, rod, or bar stock to form all types of parts. Lathe machined plastic and metal parts can be found in products ranging from motorcycles to guitars to artificial hearts.

Lathe and Turning Machine Tool Setters, Operators, and Tenders can be separated into two groups—those who operate manual lathes and those who operate computer numerical controlled (CNC) lathes. Employers often specify manual or CNC in the job title. Setup workers prepare the machines prior to production and may adjust the machinery during its operation. Operators and tenders primarily monitor the machinery during its operation, sometimes loading or unloading the machine or making minor adjustments to the controls. Many workers both set up and operate equipment. Setup workers plan and set up the sequence of operations according to blueprints, layouts, or other instructions. They adjust the speed, feed, and other controls, choose the proper coolants and lubricants, and select the instruments or tools for each operation.

Lathe and Turning Machine Tool Setters, Operators, and Tenders work in manufacturing under many different job titles including the following apprenticeable specialties:

- ▶ Engine-Lathe Set-Up Operators
- ▶ Screw-Machine Set-Up Operators, Single Spindle
- ▶ Screw-Machine Operators, Single Spindle
- ▶ Screw-Machine Operators, Multiple Spindle
- ▶ Set-Up Operators, Screw-Machine
- ▶ Hand Spinners
- ▶ Engine-Lathe Set-Up Operators, Tool
- ▶ Turret-Lathe Set-Up Operators, Tool

Tasks

- ▶ Study blueprint, layout, or chart, to visualize work and determine materials needed, sequence of operations, dimensions, and tooling instructions.
- ▶ Compute unspecified dimensions and machine settings, using knowledge of metal properties and shop mathematics.
- ▶ Select cutting tools and tooling instructions, according to knowledge of metal properties and shop mathematics, or written specifications.

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- ▶ Install holding fixtures, cams, gears, and stops to control stock and tool movement, using hand tools, power tools, and measuring instruments.
- ▶ Mount attachments, such as relieving or tracing attachments, to perform operations, such as duplicating contours of template or trimming workpiece.
- ▶ Move controls to set cutting speeds and depths, and feed rates and to position tool in relation to workplace.
- ▶ Crank machine through cycle, stopping to adjust tool positions and machine controls, to ensure specified timing, clearance, and tolerances.
- ▶ Lift metal stock or workpiece manually or using hoist, and position and secure it in machine, using fasteners and hand tools.
- ▶ Observe operation and stop machine to inspect finished workpiece and verify conformance with specifications of first-run, using measuring instruments.
- ▶ Replace worn tools and sharpen dull cutting tools and dies.

Detailed descriptions of this occupation may be found in the Occupational Information Network (O*NET) at online.onetcenter.org.

Important Skills, Knowledge, and Abilities

- ▶ Equipment Selection — Determining the kind of tools and equipment needed to do a job.
- ▶ Production and Processing — Knowledge of raw materials, production processes, quality control, costs, and other techniques for maximizing the effective manufacture and distribution of goods.
- ▶ Mathematics — Knowledge of arithmetic, algebra, geometry, calculus, statistics, and their applications.
- ▶ Visualization — The ability to imagine how something will look after it is moved around or when its parts are moved or rearranged.
- ▶ Written Comprehension — The ability to read and understand information and ideas presented in writing.
- ▶ Information Ordering — The ability to arrange things or actions in a certain order or pattern according to a specific rule or set of rules (e.g., patterns of numbers, letters, words, pictures, mathematical operations).
- ▶ Control Precision — The ability to quickly and repeatedly adjust the controls of a machine or a vehicle to exact positions.

Work Environment

Lathe and Turning Machine Tool Setters, Operators, and Tenders work in areas that are clean, well lit, and well ventilated. They are on their feet most of the day and may do some heavy lifting. These workers operate powerful, high speed machines that can be dangerous. However, risks are minimized if operators wear protective equipment such as safety glasses and earplugs to protect against flying metal or plastic particles and against noise from machinery. Operators working in the plastics industry must wear face masks or a self-contained breathing apparatus to protect themselves from dangerous fumes or dust.

Most Lathe and Turning Machine Tool Setters, Operators, and Tenders work a standard 40-hour week. However, many metalworking and plastics working shops operate more than one shift daily requiring some operators to work nights and weekends. Also, overtime work is common during heavy production periods.

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California's Job Outlook and Wages

The California Outlook and Wage table below represents the occupation across all industries.

Standard Occupational Classification	Estimated Number of Workers 2004	Estimated Number of Workers 2014	Average Annual Openings	2006 Wage Range (per hour)
Lathe and Turning Machine Tool Setter, Operators, and Tenders (Metal and Plastic)				
51-4034	6,300	5,900	120	\$10.38 to \$19.03

Wages do not reflect self-employment.

Average annual openings include new jobs plus net replacements.

Source: www.labormarketinfo.edd.ca.gov, Employment Projections by Occupation and OES Employment & Wages by Occupation, Labor Market Information Division, Employment Development Department.

Trends

Employment of Lathe and Turning Machine Tool Setters, Operators, and Tenders is expected to decline slightly compared with all occupations through 2014. However, opportunities will continue to arise from the need to replace the Lathe and Turning Machine Tool Setters, Operators, and Tenders who retire or leave the labor force for other reasons. Job growth will continue to be influenced by automation. In order to remain competitive with foreign manufacturers, many firms are using new technologies, such as computer-controlled machine tools and robots to lower production costs. Labor-saving machinery tends to reduce the need for lower skilled machine operators, because the tasks they perform are more easily automated. However, opportunities will continue to arise for those with experience on a wide variety of machines, and a good working knowledge of the properties of metals and plastics.

Training/Requirements/Apprenticeships

Lathe and Turning Machine Tool Setters, Operators, and Tenders usually follow one of the following training paths:

- ▶ High school diploma or equivalent
- ▶ Extensive on-the-job training

Some employers may offer formal training programs or apprenticeship opportunities. Also, industry associations offer voluntary certification through an exam process. The Institute for Metalworking Skills and the Society of Plastics Industry offer machine operator certification for their respective industries. Refer to Other Sources of Information.

Recommended High School Course Work

High school preparation courses in machine shop, blueprint reading, algebra, geometry, language arts, and computer technology are helpful.

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Where Do I Find the Job?

Direct application to employers remains one of the most effective job search methods.

Use the *Search for Employers by Industry* feature on the *Career Center* page at www.labormarketinfo.edd.ca.gov to locate employers in your area. Search using keywords from the following manufacturing industry names to get a list of private firms and their addresses:

- ▶ Aircraft
- ▶ All Other Motor Vehicle Parts
- ▶ Bolts, Nuts, Screws, Rivets, and Washers
- ▶ Guided Missiles and Space Vehicles
- ▶ Machine Shops
- ▶ Miscellaneous General Purpose Machinery
- ▶ Motor Vehicle Power Train Components
- ▶ Other Aircraft Parts and Equipment
- ▶ Other Motor Vehicle Electrical Equipment
- ▶ Packaging Machinery
- ▶ Precision Turned Product
- ▶ Pump and Pumping Equipment

Search these **yellow page** headings for listings of private firms:

- ▶ Metal Castings
- ▶ Metal Cutting Tools
- ▶ Metal Fabricators
- ▶ Metal Rolling and Forming
- ▶ Plastic Fabricators
- ▶ Plastics Molders, Injection
- ▶ Plastics Molders, Rotational

Where Can the Job Lead?

Advancement opportunities for Lathe and Turning Machine Tool Setters, Operators, and Tenders generally take the form of higher pay. Although, there are some limited opportunities for Lathe and Turning Machine Tool Setters, Operators, and Tenders to advance to multiple-machine operators, setup operators, or trainees for the more highly skilled position of Machinist, Tool and Die Maker, or Computer-Control Programmer or Operator. Also, skilled set-up workers may advance to supervisory positions.

Other Sources of Information

National Institute for Metalworking Skills
www.nims-skills.org

National Tooling & Machining Association
www.ntma.org

The Society of the Plastics Industry
www.socplas.org